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10/595,128	11/15/2006	Anthony Richard Pratt	2001145.120US1	3127
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60 STATE STREET			CORRIELUS, JEAN B	
BOSTON, MA 02109				
		ART UNIT	PAPER NUMBER	
		2611		
		NOTIFICATION DATE	DELIVERY MODE	
		11/25/2011	ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/595,128

Applicant(s)

PRATT ET AL.

Examiner

Jean B. Corrielus

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1,4-8,10-22,98 and 99 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1,4-8,10-22,98 and 99 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIB) Paper No(s)/Mail Date 10/3/11
- 4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of modulating the subcarrier modulation signal with the carrier signal, as recited in claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. Claims 1, 4, 13-22 and 98-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's background of the invention page 3, lines 3-22 in view of Beech et al US Patent Application Publication No. 20020164949.

As per claim 1, applicant's background of the invention page 3, lines 3-22 teaches a method of generating a navigation transmission signal comprising modulating a carrier signal by a subcarrier modulation signal to generate the navigation transmission signal note page 3, lines 5-22. However, applicant's background of the invention does not teach that the **subcarrier modulation signal includes more than 2 amplitude levels**. Beech et al teaches a satellite apparatus fig. 2 comprising a modulator 23 for modulating a subcarrier modulated signal (note that modulator 19 is a 16 QAM type modulator (note para. 0019 and claim 8) that produces a subcarrier¹ modulated signal having 3 amplitude levels²) by a carrier signal note that the IQ modulator inherently includes a carrier signal in order to perform the required modulation. Given that fact, it would have been obvious to one skill in the art to have modified applicant's background of the invention by providing a subcarrier having more than 2 amplitude levels as it would have enabled transmission to be carried out at **higher bit rate** so as to allow greater number of channels to be carried within a predefined bandwidth as taught by Beech et al see para. 0004, last 4 lines.

¹ Note US patent No. 5,963,589 ,col. 1, lines 16-18 where a 16 QAM is theme a multicarrier modulation.

² Note US patent application publication no. 2007/0047637 paragraph 0070 and fig. 4 that shows a 16QAM modulation scheme having 3 amplitude levels.

As per claim 4, as known in the art a 16QAM is a multicarrier modulation having 3 levels (note US patent application publication no. 2007/0047637 paragraph 0070 and fig. 4 that shows a 16QAM modulation scheme having 3 levels).

As per claim 13, as applied to claim 1 above, applicant's background of the invention and Beech et al teach every feature of the claimed invention but do not explicitly teach the further limitation of deriving the amplitudes from a plurality of phase states. However, selecting the amplitudes from a plurality of phase states would have been in the purview of one skill in the art as such would have enabled the amplitude of the signal that fit predetermined criterion so as to generate only desired modulated signal.

As per claim 14, providing phase states that are equally angularly distributed around the unit circle would have been in the purview of one skill in the art for the reason provided above with respect to claim 13.

As per claim 15, providing amplitudes of equal duration would have been in the purview of one skill in the art for the reason provided above with respect to claim 13.

As per claim 16, providing amplitudes of unequal duration would have been in the purview of one skill in the art for the reason provided above with respect to claim 13.

As per claim 17, it would have been obvious to one skill in the art to quantize the durations according to an associated clock signal so as to satisfy requirement of the system.

As per claim 18, it would have been obvious to one skill in the art to define the associated phase states according to mutually orthogonal axes so as to ensure that interference between the carrier signals is minimized.

As per claim 19, it would have been obvious to one skill in the art to associate the phase states with ranging signals so that the system can be used in radars that use ranging signals.

As per claim 20, it would have been obvious to one skill in the art to use unequal dwell times in the phase states for the reason provided above with respect to claim 13.

As per claim 21, it would have been obvious to one skill in the art to use a first dwell time for a first group of phase states and a second group of dwell time for a second group of phase states for the same reason provided above with respect to claim 13.

As per claim 22, see claim 17.

As per claim 98, applicant's background of the invention page 3, lines 3-12 teaches modulating a ranging signal using a subcarrier.

As per claim 99, see claim 98.

3. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's background of the invention page 3, lines 3-22 in view of Beech et al US Patent Application Publication No. 20020164949 and further in view of in view of Dahan et al US patent Application Publication No. 2002/0070799.

As per claims 5-6, as applied to claim 1 above, Applicant's background of the invention and Beech et al teach every feature of the claimed invention but do not explicitly teach the use of triangular wave as a basis waveform. As shown in at least in the drawing (see front page of the US Patent application publication No. 2002/0070799 and note input to summer 35), it is well known in the art to use a triangular wave as a basis waveform. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Applicant's background of the invention and Beech et al in order to generate desired carrier signal necessary to modulate the signal prior to transmission because, as known in the art, prior to any transmission, a signal has to properly modulated with a carrier so as to ensure proper transmission.

As per claim 7, the combined references teach every feature of the claimed invention, but do not explicitly teach the additional limitations of selecting the waveform according to desired power distribution characteristics of the transmission signal. However, selecting the waveform according to desired power distribution characteristics of the transmission signal would have been in the purview of one skill in the art. Given that it would have been obvious to one skill in the art to select the waveform according to desired power distribution characteristics of the transmission signal so as to ensure that negative effect of the transmission medium is compensated for in order to improved integrity of the transmission system.

4. Claims 8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's background of the invention page 3, lines 3-22 in

view of Beech et al US Patent Application Publication No. 20020164949 and further in view of Poklemba et al US Patent Application publication No. 20030141938.

As per claim 8, as applied to claim 1 above, Applicant's background of the invention and Beech et al teach every feature of the claimed invention but do not explicitly teach the further limitation of providing at least two mutually orthogonal subcarrier modulation signals. Poklemba et al teaches a carrier generator for generating two carrier signals $\cos wct$ and $\sin wct$ separated by a phase shift of 90 degrees. Given that fact, one skill in the art would have been motivated to generate a pair of carrier signals in the manner taught by Poklemba et al so that interference can be minimize since orthogonal carriers will ensure that the signals are separated from each other in such a way no interference can be created.

As per claim 10, Poklemba et al teaches that the carriers are separated by a predetermined phase, 90 degrees. One skill in the art would have been motivated to use such a phase shift for the reason provided with respect to claim 8 above.

As per claim 11, the Poklemba et al show an inphase carrier $\cos wct$ an inphase carrier $\sin wct$ see the drawing. One skill in the art would have been motivated to use such carriers in Applicant's background of the invention and Beech et al for the same reasons provided above with respect to claim 8.

As per claim 12, it would have been obvious to one skill in the art to determine the multiple amplitudes of the inphase and quadrature carriers to

maintain a constant transmission signal envelope and the motivation to do so would have been to ensure that the signal level is maintained within the operational range of the amplifier that may be used to transmit the signal.

Examiner's Comment

5. A copy of the information incorporated by reference in the specification page 7, lines 4-5, and line 13 was indicated to be filed on 11/25/09. However it is noted that such information was not submitted in accordance with 37 CFR 1.57 that partially states:

- (e) The examiner may require the applicant to supply a copy of the material incorporated by reference. If the Office requires the applicant to supply a copy of material incorporated by reference, the material must be accompanied by a statement that the copy supplied consists of the same material incorporated by reference in the referencing application.

Response to Arguments

6. Applicant's arguments filed 10/3/11 have been fully considered but they are moot in view of the above new grounds of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is (571)272-3020. The examiner can normally be reached on Monday-Thursday from 9:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax

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phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jean B Corrielus/
Primary Examiner, Art Unit 2611
11/18/11